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## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 39**

**[Docket No. FAA-2009-0674; Directorate Identifier 2009-NE-25-AD; Amendment 39-16244; AD 2010-07-01]**

**RIN 2120-AA64**

### **Airworthiness Directives; Rolls-Royce plc RB211-Trent 500, 700, and 800 Series Turbofan Engines**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final rule.

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**SUMMARY:** The FAA is superseding an existing airworthiness directive (AD) for the products listed above. This AD results from mandatory continuing airworthiness information (MCAI) issued by an aviation authority of another country to identify and correct an unsafe condition on an aviation product, and results from the risk of engine fuel-to-oil heat exchanger (FOHE) blockage. The MCAI describes the unsafe condition as:

In January 2008, a Boeing 777 powered by RB211-Trent 800 engines crashed short of the runway as a result of dual loss of engine response during the final stages of approach. The investigation of the incident has established that, under certain ambient conditions, ice can accumulate on the walls of the fuel pipes within the aircraft fuel system, which can then be released downstream when fuel flow demand is increased. This released ice can then collect on the FOHE front face and limit fuel flow through the FOHE. This type of icing event was previously unknown and creates ice concentrations into the fuel system beyond those specified in the certification requirements.

In May 2009, an Engine Indicating and Crew Alerting System (EICAS) surge message was set following a successful go-around maneuver on a single RB211-Trent 700 engine of an A330 aircraft. Subsequent analysis concluded the likely cause to be temporary ice accumulation causing fuel flow restriction in the FOHE. The incident has indicated the potential susceptibility to ice blockage for Airbus aircraft in combination with Rolls-Royce engines that feature similar fuel systems to the RB211-Trent 800.

We are issuing this AD to prevent ice from blocking the FOHE, which could result in an unacceptable engine power loss and loss of control of the airplane.

**DATES:** This AD becomes effective May 3, 2010. The Director of the Federal Register approved the incorporation by reference of certain publications listed in this AD as of May 3, 2010. The Director of the Federal Register previously approved the incorporation by reference of certain publications listed in the regulations as of January 4, 2010 (74 FR 6222, November 27, 2009).

**ADDRESSES:** The Docket Operations office is located at Docket Management Facility, U.S. Department of Transportation, 1200 New Jersey Avenue, SE., West Building Ground Floor, Room W12-140, Washington, DC 20590-0001.

Contact Rolls-Royce plc, P.O. Box 31, DERBY, DE24 8BJ, UK; telephone 44 (0) 1332 242424; fax 44 (0) 1332 249936, for the service information identified in this AD.

**FOR FURTHER INFORMATION CONTACT:** James Lawrence, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; e-mail: james.lawrence@faa.gov; telephone (781) 238-7176; fax (781) 238-7199.

## **SUPPLEMENTARY INFORMATION:**

### **Discussion**

The FAA proposed to amend 14 CFR part 39 by superseding AD 2009-24-05, Amendment 39-16092 (74 FR 62222, November 27, 2009), with a proposed AD. The proposed AD applies to Rolls-Royce plc RB211-Trent 500, 700, and 800 series turbofan engines. We published the proposed AD in the Federal Register on January 6, 2010 (75 FR 801). That action proposed to correct an unsafe condition for the specified products. The MCAI states:

In January 2008, a Boeing 777 powered by RB211-Trent 800 engines crashed short of the runway as a result of dual loss of engine response during the final stages of approach. The investigation of the incident has established that, under certain ambient conditions, ice can accumulate on the walls of the fuel pipes within the aircraft fuel system, which can then be released downstream when fuel flow demand is increased. This released ice can then collect on the FOHE front face and limit fuel flow through the FOHE. This type of icing event was previously unknown and creates ice concentrations into the fuel system beyond those specified in the certification requirements.

In May 2009, an EICAS surge message was set following a successful go-around maneuver on a single Trent 700 engine of an A330 aircraft. Subsequent analysis concluded the likely cause to be temporary ice accumulation causing fuel flow restriction in the FOHE. The incident has indicated the potential susceptibility to ice blockage for Airbus aircraft in combination with Rolls-Royce engines that feature similar fuel systems to the RB211-Trent 800.

To mitigate the risk of engine FOHE blockage, this AD requires, for RB211-Trent 500, 700, and 800 series turbofan engines, replacing the existing FOHE with a FOHE incorporating the modifications specified in the applicable Rolls-Royce plc Alert Service Bulletin.

## **Comments**

We gave the public the opportunity to participate in developing this AD. We considered the comments received.

### **Request To Allow Use of Later Revisions of Service Bulletins**

One commenter, Deutsche Lufthansa AG, requests that we add language to the AD that allows the use of later revisions of the service bulletins incorporated by reference. This change would make the AD more consistent with the related European Aviation Safety Agency ADs.

We do not agree. Rulemaking requirements do not permit advance approval of unknown future revisions to service bulletins. We did not change the AD.

### **Request To Change the Compliance Period**

Airline Pilots Association, International, (ALPA) requests that we change the proposed AD compliance time from "Within 6,000 flight hours after the effective date of this AD, but no later than January 1, 2011", to "Within six months after the effective date of the AD or within 6,000 flight hours after receipt of the Service Bulletin." ALPA believes that the decreased compliance times are important since, in the event a blockage of the FOHE, the current procedure requires an immediate idle descent to melt the blockage. Due to this aircraft's design mission of long range flight, it often operates over oceanic and geographically remote areas where radar surveillance may not exist and communications with the air traffic control is encumbered by language limits, poor radio reception, and third party communication relay services. These areas may concentrate traffic on specific routes or tracks. This creates the potential for traffic conflicts during the descent, without the ability to receive timely Air Traffic Control clearance or the additional safety oversight provided by radar separation. This engine rollback is very insidious to the crew and creates the potential for a pilot to be faced with an immediate descent without adequate time to compensate for traffic, weather, or terrain.

We do not agree. For the RB211-Trent 800 series engines, on February 17, 2009, the Transport Airplane Directorate issued AD 2009-05-11 that revises the airplane flight manual to include in-flight procedures for pilots to follow in certain cold weather conditions. That AD also includes mandating fuel circulation procedures on the ground when certain conditions exist. These procedures are considered adequate to assure continued safe operation through all environments and conditions, including those expressed by ALPA, until hardware modifications become available. Those procedures also reduce hazardous amounts of ice buildup within the fuel feed system and eliminate ice accumulation on the face of the FOHE. For the RB211-Trent 500 series and 700 series engines, changing the compliance time to 6 months would not result in a significant benefit to the level of safety. We did not change the AD.

## **Conclusion**

We reviewed the available data, including the comments received, and determined that air safety and the public interest require adopting the AD as proposed.

### **Differences Between This AD and the MCAI or Service Information**

The European Aviation Safety Agency (EASA) AD 2009-0142, dated July 13, 2009, and EASA AD 2009-0257, dated December 3, 2009, require replacing the FOHE within 6,000 flight hours from July 10, 2009 or before January 1, 2011, whichever occurs first. This AD requires replacing the FOHE on RB211-Trent 500 and RB211-Trent 700 series turbofan engines within 6,000 flight hours after the effective date of this AD, or before January 1, 2011, whichever occurs first, and on RB211-

Trent 800 series turbofan engines, replacing the FOHE within 6,000 flight hours after January 4, 2010 (the effective date of AD 2009-24-05), or before January 1, 2011, whichever occurs first.

## **Costs of Compliance**

Based on the service information, we estimate that this AD will affect about 138 RB211-Trent 800 series engines, and about 10 RB211-Trent 700 series engines, installed on airplanes of U.S. registry. There are currently no RB211-Trent 500 series engines installed on airplanes of U.S. registry. We also estimate that it will take about 8.5 work-hours per product to comply with this AD. The average labor rate is \$80 per work-hour. Required parts will cost about \$58,005 per product. Based on these figures, we estimate the cost of the AD on U.S. operators to be \$8,685,380.

## **Authority for This Rulemaking**

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. "Subtitle VII: Aviation Programs," describes in more detail the scope of the Agency's authority.

We are issuing this rulemaking under the authority described in "Subtitle VII, Part A, Subpart III, Section 44701: General requirements." Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

## **Regulatory Findings**

We determined that this AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify this AD:

1. Is not a "significant regulatory action" under Executive Order 12866;
2. Is not a "significant rule" under the DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979); and
3. Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

We prepared a regulatory evaluation of the estimated costs to comply with this AD and placed it in the AD docket.

## **Examining the AD Docket**

You may examine the AD docket on the Internet at <http://www.regulations.gov>; or in person at the Docket Operations office between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this AD, the regulatory evaluation, any comments received, and other information. The street address for the Docket Operations office (telephone (800) 647-5527) is provided in the ADDRESSES section. Comments will be available in the AD docket shortly after receipt.

## **List of Subjects in 14 CFR Part 39**

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

## **Adoption of the Amendment**

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

### **PART 39—AIRWORTHINESS DIRECTIVES**

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

#### **§ 39.13 [Amended]**

2. The FAA amends § 39.13 by removing Amendment 39-16092 (74 FR 62222, November 27, 2009), and by adding a new airworthiness directive, Amendment 39-16244, to read as follows:



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**2010-07-01 Rolls-Royce plc:** Amendment 39-16244. Docket No. FAA-2009-0674; Directorate Identifier 2009-NE-25-AD.

**Effective Date**

- (a) This airworthiness directive (AD) becomes effective May 3, 2010.

**Affected Airworthiness Directives (ADs)**

- (b) This AD supersedes AD 2009-24-05, Amendment 39-16092.

**Applicability**

- (c) This AD applies to:

(1) Rolls-Royce plc models RB211-Trent 553-61, 556-61, 556B-61, 560-61, 553A2-61, 556A2-61, 556B2-61, and 560A2-61 turbofan engines with fuel-to-oil heat exchangers (FOHEs) part number (P/N) 55027001-1 or 55027001-11 installed; and

(2) Rolls-Royce plc models RB211-Trent 768-60, 772-60, 772B-60, and RB211-Trent 875-17, 877-17, 884-17, 884B-17, 892-17, 892B-17, and 895-17 turbofan engines with FOHEs P/N 55003001-1 or 55003001-11 installed.

(3) The RB211-Trent 500 series engines are installed on, but not limited to, Airbus A340-500 and -600 series airplanes. The RB211-Trent 700 series engines are installed on, but not limited to, Airbus A330-200 and -300 series airplanes. The RB211-Trent 800 series engines are installed on, but not limited to, Boeing 777 series airplanes.

**Reason**

(d) This AD results from mandatory continuing airworthiness information (MCAI) issued by an aviation authority of another country to identify and correct an unsafe condition on an aviation product, and results from the risk of engine FOHE blockage. We are issuing this AD to prevent ice from blocking the FOHE, which could result in an unacceptable engine power loss and loss of control of the airplane.

**Actions and Compliance**

(e) For RB211-Trent 500 series turbofan engines and RB211-Trent 700 series turbofan engines, unless already done, within 6,000 flight hours after the effective date of this AD, or before January 1, 2011, whichever occurs first, do the following:

(1) For RB211-Trent 500 series turbofan engines, replace the FOHE P/N 55027001-1 or 55027001-11, with an FOHE that incorporates the modifications specified in Rolls-Royce plc Alert Service Bulletin (ASB) No. RB.211-79-AG346, dated October 23, 2009.

(2) For RB211-Trent 700 series turbofan engines, replace the FOHE, P/N 55003001-1 or 55003001-11, with an FOHE that incorporates the modifications specified in Rolls-Royce plc ASB No. RB.211-79-AG338, Revision 1, dated December 2, 2009.

(f) For RB211-Trent 800 series turbofan engines, unless already done, replace the FOHE, P/N 55003001-1 or 55003001-11, with an FOHE that incorporates the modifications specified in Rolls-Royce plc ASB No. RB.211-79-AG257, Revision 1, dated September 14, 2009 within 6,000 flight hours from January 4, 2010 (the effective date of FAA AD 2009-24-05), or before January 1, 2011, whichever comes first.

### **FAA AD Differences**

(g) This AD differs from the Mandatory Continuing Airworthiness Information (MCAI) by requiring replacing the FOHE within 6,000 flight hours after the effective date of this AD for RB211-Trent 500 and RB211-Trent 700 series turbofan engines or January 4, 2010 for RB211-Trent 800 series turbofan engines, rather than within 6,000 flight hours from July 10, 2009.

### **Previous Credit**

(h) For RB211-Trent 700 series engines, replacement of the FOHE with an FOHE that incorporates the modifications specified in Rolls-Royce plc ASB No. RB.211-79-AG338, dated September 29, 2009, complies with the replacement requirement specified in paragraph (e)(2) of this AD.

(i) For RB211-Trent 800 series engines, replacement of the FOHE with an FOHE that incorporates the modifications specified in Rolls-Royce plc ASB No. RB.211-79-AG257, dated June 24, 2009, complies with the replacement requirement specified in paragraph (f) of this AD.

### **Alternative Methods of Compliance (AMOCs)**

(j) The Manager, Engine Certification Office, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19.

### **Related Information**

(k) Refer to European Aviation Safety Agency MCAI AD 2009-0142, dated July 13, 2009, and MCAI AD 2009-0257, dated December 3, 2009, for related information.

(l) Contact James Lawrence, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; e-mail: james.lawrence@faa.gov; telephone (781) 238-7176; fax (781) 238-7199, for more information about this AD.

### **Material Incorporated by Reference**

(m) You must use the service information specified in Table 1 of this AD to perform the FOHE modifications required by this AD, unless the AD specifies otherwise.

(1) The Director of the Federal Register approved the incorporation by reference of Rolls-Royce plc Alert Service Bulletin No. RB.211-79-AG346, dated October 23, 2009, and Rolls-Royce plc Alert Service Bulletin No. RB. 211-79-AG338, Revision 1, dated December 2, 2009 under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) The Director of the Federal Register previously approved the incorporation by reference of Rolls-Royce plc ASB No. RB.211-79-AG257, Revision 1, dated September 14, 2009, as of January 4, 2010.

(3) For service information identified in this AD, contact Rolls-Royce plc, P.O. Box 31, DERBY, DE24 8BJ, UK; telephone 44 (0) 1332 242424; fax 44 (0) 1332 249936.

(4) You may review copies at the FAA, New England Region, 12 New England Executive Park, Burlington, MA; or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call (202) 741-6030, or go to: <http://www.archives.gov/federal-register/cfr/ibr-locations.html>.

**Table 1 – Material Incorporated by Reference**

<b>Rolls-Royce plc Alert Service Bulletin No.</b>	<b>Page</b>	<b>Revision</b>	<b>Date</b>
RB.211-79-AG346	All	Original	October 23, 2009
Total Pages: 28			
RB.211-79-AG338	All	1	December 2, 2009
Total Pages: 25			
RB.211-79-AG257	All	1	September 14, 2009

Issued in Burlington, Massachusetts, on March 17, 2010.  
 Francis A. Favara,  
 Manager, Engine and Propeller Directorate,  
 Aircraft Certification Service.